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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/853,434	05/10/2001	Duane A. Goetsch	1.905.4	6758

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EXAMINER
LANGEL, WAYNE A

ART UNIT	PAPER NUMBER
1754	5

DATE MAILED: 05/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

A85

Office Action Summary

Application No.	Applicant(s)
853434	Goetsch et al
Examiner	**Group Art Unit**
Langel	1754

—Th MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☒ Claim(s) 1-27 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-27 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. _____.

☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____.

Attachment(s)

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 4

☐ Interview Summary, PTO-413

☒ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Pat nt Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other _____

Office Action Summary

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Rosenblatt et al. Rosenblatt et al. disclose a method for converting ammonia into nitrogen and hydrogen, comprising passing a mixture of gaseous ammonia and an oxygen containing gas over a supported catalyst to combust some of the ammonia to nitrogen, the mixture passing over the catalyst at a temperature of at least 500°C, and over a supported catalyst to crack at least some of the remaining ammonia, utilizing the heat

of the combustion reaction to supply at least part of the heat required for the cracking reaction. (See column 4, lines 50-62.) Rosenblatt et al. disclose at column 2, lines 26-30 and again at column 4, lines 63-67 that the catalyst may constitute ruthenium. Rosenblatt et al. further teach at column 4, lines 33-38 that the ruthenium may be deposited on a support of aluminum oxide.

Claims 9-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Rosenblatt et al. Rosenblatt et al. is relied upon as discussed hereinbefore. Regarding claims 9 and 10, it would be prima facie obvious to employ an alumina support in the form of a monolith as the support in the process of Rosenblatt et al., since it is well-known that monoliths are employed as catalyst supports in order to provide more surface area for the catalyst to contact the reactants. Regarding claim 11, it would be prima facie obvious to carry out the process of Rosenblatt et al. in a thermal integration reactor wherein a hot effluent gas is produced which transfers heat to incoming feed of ammonia and an oxygen-containing gas, since Rosenblatt et al. suggest at column 4, lines 50-62 that the combustion reaction is exothermic whereas the decomposition reaction of ammonia is endothermic, and one of ordinary skill in the art would be motivated not to waste the exothermic heat of reaction of the combustion step.

Claims 12-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Boffito et al. in view of Rosenblatt et al.

Boffito et al. disclose a process for cracking ammonia to produce hydrogen, wherein the hydrogen is employed to power hydrogen-powered internal combustion engines or to operate a fuel cell. (See column 3, lines 10-63, especially lines 52-63.) The difference between the process disclosed by Boffito et al., and that recited in applicant's claims, is that Boffito et al. do not disclose passing a mixture of ammonia and an oxygen-containing gas to a reaction zone wherein the ammonia undergoes decomposition to nitrogen and hydrogen and wherein a first portion of the hydrogen is combusted in the reaction zone to produce an effective amount of heat to maintain the ammonia decomposition reaction. Rosenblatt et al. is relied upon as discussed hereinbefore. It would be obvious from Rosenblatt et al. to generate the hydrogen required for the hydrogen fuel cell or internal combustion engine of Boffito et al. by passing a mixture of ammonia and an oxygen-containing gas to a reaction zone containing an ammonia decomposition catalyst at effective conditions under which the ammonia undergoes decomposition to nitrogen and hydrogen and wherein a first portion of the hydrogen is combusted in the reaction zone to produce an effective amount of heat to maintain the ammonia decomposition reaction, since Rosenblatt et al. disclose such a method for producing hydrogen at column 4, lines 50-62, and one of ordinary skill in the art would recognize that the hydrogen required for the internal

combustion engine or fuel cell of Boffito et al. could be produced by any known or conventional manner.

Claims 12-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenblatt et al. as applied to claim 1 above, and further in view of Boffito et al. Boffito et al. is relied upon as discussed hereinbefore. It would be prima facie obvious from Boffito et al. to employ the hydrogen produced in the process of Rosenblatt et al. to power an internal combustion engine or to operate a fuel cell, since Boffito et al. disclose such uses for hydrogen in the Abstract, and one of ordinary skill in the art would recognize that the hydrogen produced according to the process of Rosenblatt et al. could be employed for any known or conventional uses.

Claims 6 and 23 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation of "support selected from . . ." is improper Markush terminology. The phrase --the group consisting of-- should be inserted after "from" to avoid this rejection.

Shikada et al. '756 and Shikada et al. '282 are made of record for disclosing methods for decomposing ammonia in the presence of oxygen gas.

DiMartino is made of record for disclosing the production of hydrogen by dissociating ammonia into its constituents.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (703) 308-0248. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2351.

WAL:cdc
May 14, 2003

Wayne A. Langel
WAYNE A. LANGEL
PRIMARY EXAMINER